

CLAIMS

I claim:

- 1 1. A catalyst for removing arsenic from a petroleum fraction comprising a porous refractory
2 support, at least 8 wt. % of a Group VIB metal selected from molybdenum and tungsten and
3 an amount of a Group VIII metal selected from nickel and cobalt sufficient to result in an
4 atomic ratio of the Group VIII metal to the Group VIB metal of between 1.5 and 2.5.
- 1 2. The catalyst of claim 1 wherein the porous refractory oxide is selected from alumina,
2 alumina-silica, silica, titania, zirconia, boria, magnesia, zeolites and combinations thereof.
- 1 3. The catalyst of claim 1 wherein the porous refractory oxide is alumina.
- 1 4. The catalyst of claim 1 wherein the Group VIB metal is molybdenum and the Group VIII
2 metal is nickel.
- 1 5. The catalyst of claim 1 wherein the Group VIB metal comprises between 8 wt. % and 14 wt.
2 % molybdenum and the Group VIII metal comprises between 8 wt. % and 14 wt. % nickel.
- 1 6. The catalyst of claim 1 wherein the catalyst further comprises between 0.1 wt. % and 3 wt.
2 % phosphorus.
- 1 7. The catalyst of claim 1 wherein the Group VIB metal comprises between 8 wt. % and 14 wt.
2 % molybdenum and the Group VIII metal comprises between 8 wt. % and 14 wt. % nickel,
3 and wherein the catalyst further comprises approximately 2 wt. % phosphorus.
- 1 8. A process for making a catalyst for removing arsenic from petroleum fractions comprising:
2 a) impregnating a porous support with sufficient amount of a solution of a Group VIII
3 metal compound selected from nickel and cobalt compounds such that the
4 impregnated support comprises at least 8 wt. % Group VIII metal calculated as the

- 5 metal;
- 6 b) drying the impregnated support of step (a) and then calcining at a temperature of at
- 7 least 427°C;
- 8 c) impregnating the product of step (b) with a solution comprising a Group VIB
- 9 compound selected from molybdenum and tungsten compounds and, optionally, an
- 10 additional amount of the Group VIII compound deposited in step (a), wherein the
- 11 amount of Group VIB compound is such that the atomic ratio of all the Group VIII
- 12 metal impregnated to the amount of Group VIB metal impregnated is between 1.5
- 13 and 2.5; and
- 14 d) drying and calcining the product of step (c), wherein said calcining is done at a
- 15 temperature at least 30°C lower than the calcining performed in step (b).

1 9. The process of claim 8 wherein the Group VIII metal compound is at least one nickel

2 compound.

1 10. The process of claim 8 wherein the Group VIII metal compound is at least one nickel

2 compound and the Group VIB metal compound is at least one molybdenum compound.

1 11. The process of claim 8 wherein the Group VIII metal compound is a mixture of

2 $\text{Ni}(\text{NO}_3)_2 \cdot 6\text{H}_2\text{O}$ and NiCO_3 and the Group VIB metal compound is a mixture of $(\text{NH}_4)_2\text{Mo}_2\text{O}_7$

3 and MoO_3 .

1 12. The process of claim 8 wherein the amount of Group VIB compound is such that the atomic

2 ratio of all the Group VIII metal impregnated to the amount of Group VIB metal

3 impregnated is about 2.

1 13. The process of claim 8 wherein the solution used in step (c) further comprises phosphoric

2 acid.

- 1 14. The process of claim 8 wherein the porous refractory support is alumina.
- 1 15. The process of claim 8 wherein the porous refractory support is alumina containing
2 approximately 1 wt. % nickel.
- 1 16. The process of claim 8 wherein the porous refractory support is alumina, the Group VIII
2 metal compound is a nickel compound, the Group VIB metal compound is a molybdenum
3 compound, and wherein the amounts of nickel and molybdenum compounds impregnated
4 on the support are such that the catalyst comprises between 8 wt. % and 14 wt. %
5 molybdenum and between 8 wt. % and 14 wt. % nickel.
- 1 17. The process of claim 8 wherein the porous refractory support is alumina, the Group VIII
2 metal compound is a nickel compound, the Group VIB metal compound is a molybdenum
3 compound, the solution used in step (c) further comprises phosphoric acid, and wherein the
4 amounts of nickel and molybdenum compounds and phosphoric acid impregnated on the
5 support are such that the catalyst comprises between 8 wt. % and 14 wt. % molybdenum,
6 between 8 wt. % and 14 wt. % nickel, and between 1 wt. % and 3 wt. % phosphorus.
- 1 18. A catalyst for arsenic removal made by the process of claim 8.
- 1 19. A process for removing arsenic from a petroleum fraction comprising contacting the fraction
2 with the catalyst of Claim 1 at elevated temperature and elevated pressure in the presence of
3 hydrogen.
- 1 20. The process of Claim 19 wherein said contacting is done in a plurality of fixed catalyst beds
2 and the catalyst of Claim 1 is installed in the first of said beds.